

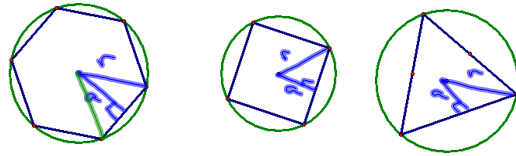
Test FRIDAY

# 11-6 Areas of Regular Polygons

Any regular polygon can be inscribed in a circle.

Radius--from center to vertex

Apothem--from the center and perpendicular to one side



## Area = $\frac{1}{2} a p$

example 1:  
regular hexagon  
side = 8 cm

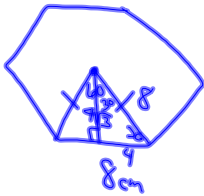
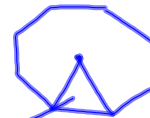


Figure out central  $\angle$ .  
 $360^\circ \div 6 = 60^\circ$

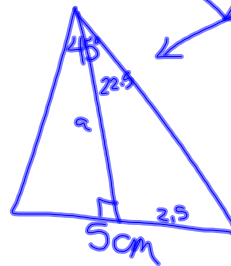
$$A = \frac{1}{2} 4\sqrt{3} \cdot 48 = 96\sqrt{3} \text{ cm}^2$$

## Area = $\frac{1}{2} a p$

example 2:  
regular octagon  
side = 5 cm



$$360 \div 8 = 45$$



$$\tan 22.5 = \frac{2.5}{a}$$

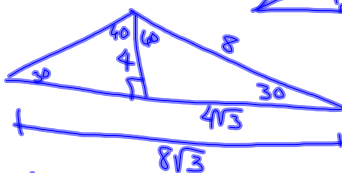
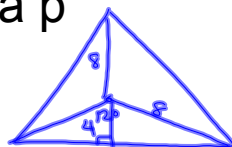
$$6.0 = a$$

$$A = \frac{1}{2} 6.0 (40)$$

$$A \approx 120.7 \text{ cm}^2$$

## Area = $\frac{1}{2} a p$

example 3:  
regular triangle  
apothem = 4 cm



$$A = \frac{1}{2} 4 \cdot 24\sqrt{3}$$

$$48\sqrt{3} \text{ cm}^2$$

$$A = \frac{s^2 \sqrt{3}}{4}$$

$$A = \frac{(8\sqrt{3})^2 \sqrt{3}}{4}$$

$$48\sqrt{3} \text{ cm}^2$$

$$A = \frac{1}{2} b h$$

$$= \frac{1}{2} 8\sqrt{3} (12)$$

$$48\sqrt{3} \text{ cm}^2$$

## Area = $\frac{1}{2} a p$

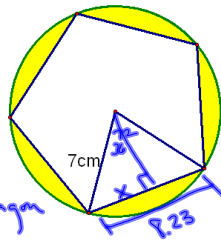
example 4:  
regular pentagon  
perimeter = 90 cm

$$a = 12.4$$

$$A \approx 557.4 \text{ cm}^2$$

Example 5:

Find the area of the shaded region.



$$A_{\text{circle}} - A_{\text{pentagon}}$$

$$\cos 36^\circ = \frac{a}{7}$$

$$5.66 \approx a$$

$$\sin 36^\circ = \frac{x}{7}$$

$$4.11 \approx x$$

$$P = 41.14$$

$$49\pi - \frac{1}{2} 5.66 \cdot 41.14$$

$$A \approx 37.5 \text{ cm}^2$$

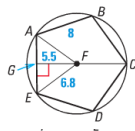
HW

p765-766

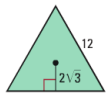
#s 1-4, 14-16, 27-29

**VOCABULARY** In Exercises 1–4, use the diagram shown.

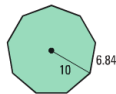
1. Identify the *center* of regular polygon  $ABCDE$ .
2. Identify a *central angle* of the polygon.
3. What is the *radius* of the polygon?
4. What is the *apothem*?

**FINDING AREA** Find the area of the regular polygon.

14.



15.



16.



at classzone.com

**POLYGONS IN CIRCLES** Find the area of the shaded region.

27.



28.



29.

